INERTIAL CONFINEMENT FUSION
Lawrence Livermore National Laboratory

Monthly Highlights

July 1999

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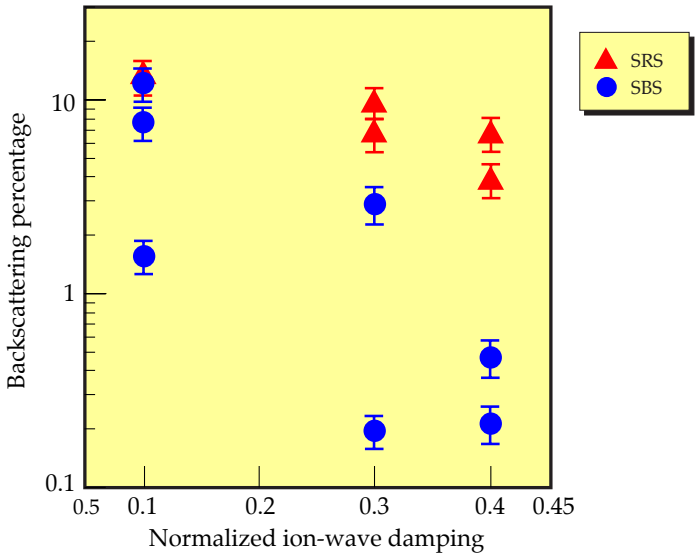
NIF Laser Bay 2 Pedestal Construction Under Way. Formation of the concrete pedestal for Laser Bay 2 in the National Ignition Facility (NIF) Laser and Target Area Building (LTAB) advanced significantly in July (see photo below). Crews continued installation of wallboard and put in place two 25-ton cranes. This work is part of an overall shift in construction from conventional facilities to the LTAB infrastructure, around which the special laser equipment will be built.

Laser Bay 2 concrete pedestal forming continues.

B381 Conversion Complete. Conversion of Lawrence Livermore National Laboratory's Building 381 high bay area, previously used for the Beamlet laser, was completed in June. The area (see photo below) will be used for building the National Ignition Facility (NIF) lasers. It now includes a large, Class 100 clean room with close temperature control to meet the stringent requirements for buildup of the bus-size NIF frame assembly units. Following assembly and alignment verification, these units will be installed in the LTAB laser bays, where they will house the large glass amplifiers.

The old Beamlet high bay area is ready to begin its new role—building NIF lasers.

Cryogenic Gasbag Experiment Complete. Laser beams in a National Ignition Facility (NIF) hohlraum will encounter laser plasmas having high ion-wave damping levels, which could potentially increase the amount of undesirable laser backscatter. To investigate this effect, we conducted a Nova experiment using a kinoform phase plate (KPP)-smoothed, $f/4.3$ beam (2×10^{15} W/cm^2 at 351 nm) and 3-mm-diam, cryogenically cooled gasbag targets spanning a range of ion damping values and electron temperatures. The graph below shows that as the ion damping increases, stimulated Raman backscatter (SRS) decreases slightly from 10 to 7%, and stimulated Brillouin backscatter (SBS) decreases from about 10% to below 1%. These results give us confidence that high ion damping in NIF hohlraums will not cause significant backscattering.



High levels of ion-wave damping in a NIF-like gasbag target do not appear to increase stimulated laser backscattering.

Science Workshop. Richard Petrasso from the Massachusetts Institute of Technology is organizing a workshop, Frontier Science at the National Ignition Facility: Episode I, October 4–6, 1999, in Pleasanton, CA. The purpose of the workshop is to plan cutting-edge physics experiments that will exploit the unique capabilities of the National Ignition Facility. Details of the agenda, registration, and announcement can be found at www.dp.doe.gov/ifnif/workshop.html, or contact Rich Petrasso at petrasso@psfc.mit.edu.

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